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# MEETS WATER

## Riparian Areas In The Southwest

United States  
Department of  
Agriculture

PREPARED BY  
Forest  
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Southwestern  
Region

# Water In The Arid Southwest

**P**eople have always relied on the natural water resources of the arid Southwest. A thousand years ago, farmers used clay jars to carry water from streams and puddles to their rows of growing corn. Today, diesel pumps lift water up a thousand feet to the surface for crop irrigation, industries, and growing cities. Technologies have changed but water remains vital to all life — whether it's a field of alfalfa, a human eating dinner, a bobcat drinking from a stream, or marsh grass sheltering frogs and water birds. A thousand years ago water was more abundant in the Southwest than it is today. While water has become scarcer, millions of people now compete with wild systems for the limited water that remains.

## Riparian Areas

Wild systems closely connected with water are called riparian areas. They make up less than 2% of the land of New Mexico and Arizona, yet they are the most biologically diverse and important ecosystems in the Southwest. Over 65% of Southwestern animals rely on riparian areas during all or part of their life cycles. Millions of Southwestern residents and visitors depend on these same areas for recreational and agricultural needs.

A riparian area exists wherever there is water on the land. It can be a stream bank, a lake shore, a desert bosque, a marsh, or an area where there is seasonal water. Some riparian areas may look dry, but you can tell water





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is near the surface by the presence of cottonwood trees.

Flooding is important to the health of riparian areas. As flood waters flow downhill, they move nutrients, plants, animals, and seeds through ecosystems. Fertile new flood-plains, sand bars, and exposed soil provide opportunities for the growth of riparian-dependent plant species. Healthy riparian areas reduce the frequency and extremes of flooding to the benefit of people and the land.

As more kinds of plants grow, more kinds of animals are attracted by food and nesting sites. Animals are also drawn to the shade and hiding cover provided by trees and undergrowth. Predatory animals hunt in these areas, eating animals that eat plants, and animals that eat each other. This process creates a continual cycling of energy.

## Diversity

The key to the survival of riparian areas is diversity. Diversity means "many things that are unlike each other." Diverse ecosystems not only include a variety of species,

but also complex, interdependent energy cycles. Humans are part of these systems. Through scientific research, we have learned much about the complex interrelationships between riparian plants, animals, and people, but we still have much to learn. We **do** know that the more heavily people use South-western riparian areas, the more ecosystem health and diversity are diminished.







## Riparian Complexity

Riparian areas have a greater variety of life underground than above the surface. Vast root systems, bacteria, fungi, ground-dwelling mammals, insects, and worms form complex plant and animal communities. These are the nutritional cycling systems which nourish the larger plants and animals living above ground. This "hidden" diversity is as important as the diversity we can see and appreciate.

Many mammals visit water-influenced areas at night, but riparian life is most active in the early morning or late evening. This illustration shows some of the plants and animals that live in Southwestern riparian areas between the elevations of 7,500 and 8,500 feet. The fifteen plants and animals described are only a fraction of the thousands of life forms that may live in and around mountain streams. The complex interchanges among all these species are essential for a healthy riparian ecosystem.

WESTERN  
TANAGER

NARROWLEAF  
COTTONWOOD

BIG  
BROWN  
BAT

BELL'S  
VIREO

VIRGIN'S  
BOWER

WILLOW

LADYSLIPPER

SEDGE

DIPPER

WESTERN  
RIBBON  
SNAKE

RACCOON

LEOPARD FROG

DAMSELFLY

nymph  
adult

CUTTHROAT  
TROUT

BEAVER

### Cutthroat Trout

These trout are native to Southwestern mountain streams above 7,000 feet. They feed on insects on or near the stream's surface.

### Leopard Frog

This frog feeds on insects, and is eaten by birds, snakes, and raccoons. Recently, amphibian populations around the world have decreased rapidly for unknown reasons.

### Western Tanager

The brilliantly-colored male is often seen in Southwestern mountains during the summer. Both the less colorful yellow-green female and the male feed on fruits and insects.

### Raccoon

Raccoon tracks can be found on the sandy banks of most riparian areas. They feed at night, preferring grubs, worms, eggs, crawfish, and other stream-dwelling animals. Always inquisitive, they will dig up and scatter any garbage that has been left behind in campsites.

### Sedge

Sedge builds strong root systems that stabilize shore lines. Because grazing animals find sedge very palatable, it has disappeared from many riparian areas.

### White Clematis or Virgin's Bower

This woody vine can grow to thirty

feet long, often nearly covering small trees. The feathery seed tails can be bunched together to form a tender for fire-starting.

### Narrowleaf Cottonwood

These trees can grow to fifty feet tall. Their branches provide shade and nest sites for many kinds of birds. Their narrow leaves are shaped like the leaves of neighboring willows.

### Bell's Vireo

This bird nests in leafy thickets near streams. Its chirping phrases slur upward and then downward as though it were asking and answering a question.

### Big Brown Bat

Millions of Southwestern bats feed on flying insects in night skies. Without bats, these insect populations would increase dramatically.

### Willow

Often found in dense thickets, this low-growing tree provides habitats for many kinds of small animals. It is a favorite food of beavers and elk.

### Ladyslipper

This unusual flower can be found in moist areas near streams. It grows about twelve inches high with a yellow sac-shaped throat and twisted reddish-brown sepals. Please remember this plant by photograph-

ing or drawing, rather than picking it, since only a mature plant can reproduce itself.

### Western Ribbon Snake

This slender snake is often found near water or sunning in growth that overhangs water. If frightened, it may retreat by swimming to another area.

### Beaver

Beavers can return riparian areas to good health. The dams beavers construct slow water and allow organic matter to remain in the area. These rich soils support many plant species such as willows, cottonwoods, and sedges.

### Dipper or Water Ouzel

Dippers feed in the rapids of mountain streams. This small bird flies into the water and appears to run along the bottom with half-open wings as it captures insects.

### Damselfly

Barely an inch long, the damselfly is only one of many kinds of insects found near water. Huge numbers of insects form the bottoms of complex riparian food webs.

### Humans

We are part of all the ecosystems we visit. Our actions in riparian areas affect the future of the areas in positive or negative ways.









## The Look of Riparian

Spruce-fir ecosystems, found above 10,000 feet, shade winter snow banks and allow them to melt slowly. This fresh water replenishes streams, springs, and underground aquifers.



High country streams are frozen on the surface and covered with snow in the winter, but melting begins in early spring. Marsh marigolds can withstand cold nights, and start to grow and bloom when night temperatures still fall below freezing. Elk relish these early bloomers.



Most high country lakes have been formed by ice age glaciers, rock slides, or by damming. Many of these lakes are stocked with trout. If you are very quiet and stay away from the shore, you may be treated to glimpses of wildlife coming the lake to drink or hunt.



A desert bosque (small forest) is usually marked by tall cottonwood trees. These areas are rich in diverse plant and animal communities compared to the drier land that surrounds them. If you sit quietly, you may see fish feeding, birds nesting, or deer moving down to the water's edge to drink.



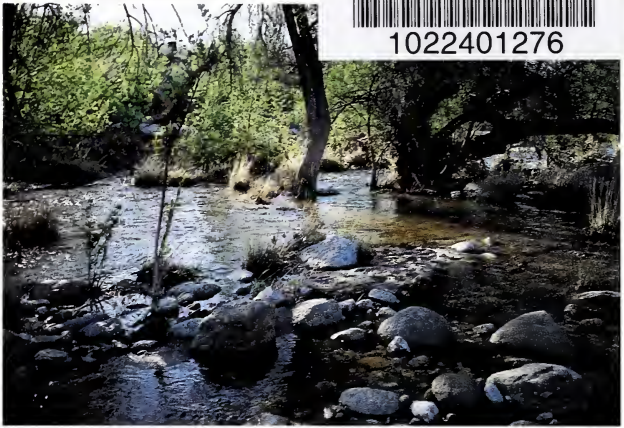
Marshes are special wildlife habitats. Although water movement may not be noticeable, these areas are connected to other riparian areas. Often drained for agriculture, many of these areas are being returned to wetlands because of the wildlife and migratory birds they support.



In the lower elevations of the arid Southwest, many drainages hold surface water only part of the year. However, water is often present year around a few feet below the surface. Even these areas of little rainfall are important to many kinds of plants and animals.



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Rod Replegle

## Your Visits to Riparian Areas

**H**umans can overpower riparian areas with their needs and expectations. Just as many other animals seek riparian areas, humans enjoy being close to water for recreation, agriculture, and home sites. However, our actions can alter riparian systems. What can you do to help conserve riparian areas?

- Unless you are using a developed campground, camp at least 200 feet away from riparian water sources.
- Always take all your garbage home with you. Skunks and other animals will dig up and scatter buried garbage.
- If you take water out of a riparian water source for washing, dispose of the dirty water on the land, not in the water.
- Clean fish on land and put all materials from the cleaning in the garbage.

Enjoy the riparian areas you visit, but share them fairly with other living things.

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